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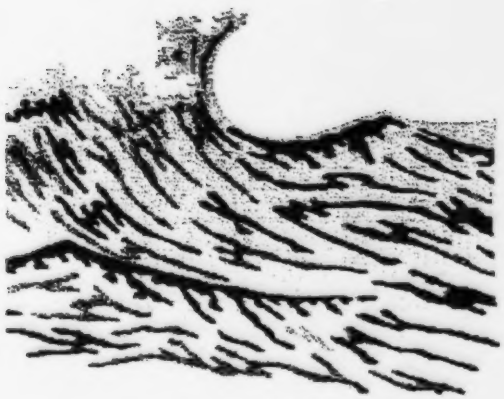
COUNCIL

2000 / 2001 CONSERVATION REQUIREMENTS FOR GEORGES BANK GROUNDFISH STOCKS AND 2J3KL COD

REPORT TO THE MINISTER OF FISHERIES AND OCEANS



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LETTER TO THE MINISTER

May 24, 2000

The Honourable Herb Dhaliwal, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, ON K1A 0E6

Dear Minister,

The Fisheries Resource Conservation Council (FRCC) herewith presents to you its report on 2000/2001 Conservation Requirements for Georges Bank Groundfish Stocks and 2J3KL Cod.

Your Council's advice is to increase cautiously total removals for the Georges Bank haddock and yellowtail flounder stocks. This positive advice for the fishery is tempered by recommendations to decrease total removals of Georges Bank cod and to decrease the catch of northern cod.

During our April consultations in Newfoundland, the Council heard overwhelmingly from the 800 fishermen in attendance about the impact which seals are having on the recovery of the northern cod stock. The Council agrees with fishermen that predation by seals is negatively impacting the stock, and has provided advice on the management of seal predation which builds on our 1999 advice on seals. Fishermen also report that cod on the shelf are not living beyond five years, and scientists cannot specify the cause.

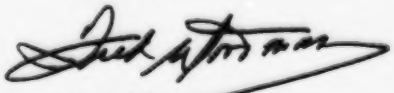
The Council is heartened by the increased information available to it partly as a result of the coastal fishery conducted in 3K and 3L last year. This information is a vital part of our understanding of the state of the northern cod stock. Indeed, our advice for 2000 underlines the need to gather information through a continued sentinel fishery in coastal 2J3KL, and an index fishery in coastal 3K and 3L. Only fisheries that contribute to this information gathering should be pursued for this stock.

On Georges Bank, the haddock and yellowtail stocks are recovering from the lows of the 1990's. The Council has continued to use the conservation objectives it has set out in the past for these stocks in order to provide its advice to you for 2000. However, the Council was not able to achieve its objectives in the Georges Bank cod stock. The Council has provided advice on this stock which allows the mixed cod/haddock fishery to continue: such a fishery will prolong the recovery of the cod stock, and the Council accepts this as a reasonable compromise in the short term. The increasing strength of the haddock stock will complicate this situation, and reasonable measures must be implemented to avoid cod in the directed haddock fishery.

The Council's advice on Georges Bank yellowtail flounder and haddock is for catch levels lower than those recommended by industry during our consultations in early May. For yellowtail flounder, the recommended catch level reflects the strong presence in the population of a single year class which makes up 43% of the total biomass. For haddock, the recommended catch level reflects that the stock still remains below biomass levels of the 1930's to the 1950's, and the Council's belief that the higher catch levels recommended by industry would not be prudent given the uncertainties surrounding this stock that continues to rebuild.

As we indicated in our report on Gulf of St. Lawrence stocks, over the next year, the Council will undertake discussions with stakeholders in the fishing industry, with scientists and fisheries managers within your Department to continue the development of strategies, objectives and indicators for the stocks within the FRCC's mandate.

Sincerely,



Fred Woodman
Chairman

Georges Bank Groundfish Stocks

INTRODUCTION

The following discussion and recommendations apply to all three groundfish stocks on Georges Bank, 5Zjm cod, 5Zjm haddock, and 5Zjmnh yellowtail flounder.

Due to discrepancies between the results of the Stock Status Reports and industry observations, especially for cod, industry questioned the effectiveness of the DFO research surveys in their ability to catch juvenile fish and the overall catchability of cod and yellowtail flounder. Industry also questioned the survey design and selection of strata for yellowtail flounder and expressed a lack of confidence in the research vessel surveys in general.

It was noted that a workshop between industry and government on survey methodology would be beneficial to both sides with a view to improving understanding of their design and impact on stock assessment.

The FRCC recommends that DFO Science convene with industry a workshop on survey methodology for Georges Bank stocks to be held in 2000-2001. This workshop should:

i. **examine opportunities for improved understanding of the research vessel gear deployment, catchability and survey design; and**

ii. **address and explore the effectiveness of implementing in the 2000 fishery additional joint DFO-industry research activity to assist in stock assessment.**

Once again in 2000, in order to mitigate potential by-catch problems in the mixed cod and haddock fisheries, industry requested an opening date of June 1st for this fishery.

The FRCC recommends that the fishery for Georges Bank commence on June 1st, 2000.

The FRCC is pleased to note that discussions are continuing with the United States on Georges Bank stocks. Industry representatives noted the need for a harmonized management of the Georges Bank stocks by Canada and the U.S.

The FRCC reiterates its previous recommendation that Canada and the United States continue discussion with the objective of ensuring continued stock rebuilding by adopting consistent management and conservation measures on both sides of the Hague Line.

The FRCC has endorsed the need for longer-term planning for conservation of Altantic groundfish stocks within an ecosystem and precautionary framework. In 2000, the Council plans to engage industry and the Department in consultations towards the development of these longer-term conservation plans for Georges Bank groundfish stocks. Pending the adoption of such plans, the Council has constructed its recommendations for 2000 within the context of previously identified stock specific criteria.

PREVIOUS RECOMMENDATIONS

The FRCC feels it is not necessary to reiterate every recommendation made in past reports. Unless clearly stated otherwise, those recommendations are still valid.

GEORGES BANK QUESTIONNAIRE TO STAKEHOLDERS

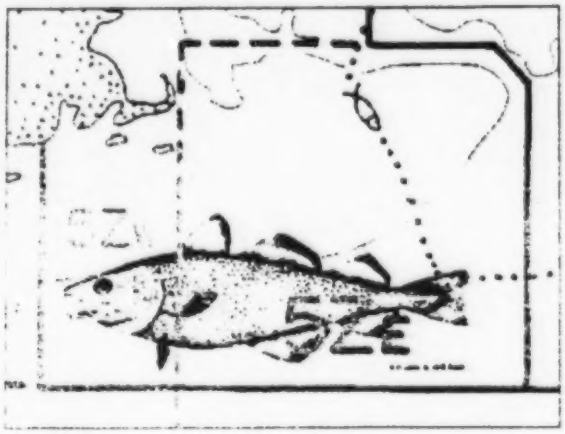
The Georges Bank questionnaire to participants in the 1999 fishery asked fishermen about their observations and their views on stock status. Respondents represented about 15% of total vessel operators in the Georges Bank fishery in 1999 with information from fishermen in the fixed gear <45' sector, the mobile gear <65' ITQ fleet, and from the over 100' vessels sector. The majority of respondents (from the <45' fixed gear sector) fished between the opening of the fishery in June and September. Mobile gear fishermen fished in all months from June to December. Nearly 90% of respondents reported that they had more than 10 years of experience in fishing on Georges Bank.

Fishermen reported that they experienced better catch rates in 1999 for all three stocks. They also noted that all groundfish stocks were easy to find, although longline fishermen in particular commented that regulations prevented them from catching available fish, especially cod. Nearly all respondents noted the effectiveness of the Georges Bank monitoring program including 100% dockside monitoring, at-sea boarding, and observer coverage. A majority of respondents to the questionnaire noted that the water temperature had been warmer on Georges Bank in 1999 and that predators and prey were evident in 1999 to the same extent or more than that observed in 1998. Fishermen also reported more small cod, and more large haddock and yellowtail flounder were present on Georges Bank in 1999.

Environmental Overview for Georges Bank

The known physical and biological attributes are generally positive. Measured temperature conditions were above the long-term mean. Overall predator-prey conditions for groundfish seem to be reasonably favourable. Prey for haddock and yellowtail flounder include worms, nematodes, and brittle stars. While the abundance of these species is not measured, the growth and condition of haddock and yellowtail flounder as well as their improving abundance indicate favourable feed conditions. Prey for cod, e.g., herring, is abundant and the availability of sandlance appears to be improving. Fishermen also observe that the strong presence of whales and seabirds on the northern edge of the Bank indicate favourable feed conditions. The relative abundance of major predator species for groundfish in the area (dogfish, shark, and cod) is moderate and variable. In light of the cod recruitment problem, the Council raises the question of whether there may be a linkage between the increasing abundance of pelagics on Georges Bank and the survivability of cod egg and larvae.

COD - 5ZJ,M



PERSPECTIVE

Fishermen have fished Georges Bank cod since the late 1700s. However, only Canada and the United States of America have had directed fisheries on this stock since 1977. On Georges Bank, cod and haddock are transboundary and are caught together in a mixed groundfish fishery predominantly by longline gear. However, the catchabilities of cod and haddock differ and they are not necessarily caught in proportion to their relative abundance.

In the post 1977 period, combined USA and Canada catches peaked at 26,000t in 1982 and declined to their lowest level of 1,800t in 1995 when fishing was restricted to by-catch only. Since 1996 total landings have averaged about 3,000t with Canada accounting for more than two-thirds of landings.

Management of the Canadian fishery has included seasonal closures to all gear sectors from January 1 to May 31 since 1994. Vessels >65' operate under enterprise allocations, mobile gear <65' under ITQs, and fixed gear under individual or community quotas. The U.S. fishery has been constrained by specified area year-round closures since 1995.

In the most recent years, the growth of the Georges Bank cod stock has been hindered by poor recruitment despite low rates of exploitation.

INTERIM STOCK OBJECTIVES

In past reports, the Council had the following interim objectives for this stock:

- total removals based on exploitation below $F_{0.1}$;
- 25,000t interim threshold for spawning stock biomass (ages 3+) to improve the chances of good recruitment;
- an expected annual increase in cod biomass of 5 percent or greater;
- a probability of decline in cod biomass on the order of 20 percent or less; and
- continue to guard against the potential for dumping and discarding in the mixed haddock/cod fishery.

ANALYSIS

Although the exploitation rate in 1999 was below $F_{0.1}$, the stock experienced a decrease in spawning stock biomass in 2000. This stock is at approximately 18,000t of spawning stock biomass in 2000, a decrease of approximately 500t since 1999, but above the lowest estimated level of about 7500t in 1995. A combination of poor recruitment and higher than expected catches resulted in this stock not achieving the 5% expected growth projected last year.

Consultations on 5Zjm cod were held in Yarmouth on May 9, 2000. Generally fishermen expressed the view that the cod stock does not seem to be in as much difficulty as is portrayed in the Stock Status Report (SSR). Fishermen report continued good catch rates in the directed cod fishery and significant cod by-catch in directed haddock trips. Despite efforts to avoid traditional areas of high cod concentrations, fishermen report that catch rates of cod continue to be high.

The Council continues to be very concerned with the lack of recruitment experienced in this stock. The SSR notes that the 1997 and 1998 recruiting year-classes are the lowest observed in the series as one year olds. In addition, recruitment has been below the 1978 to 1998 average since the 1990 year-class. Production from the stock is coming almost entirely from somatic (body) growth rather than recruitment.

Fishermen on the other hand, feel strongly that research vessel surveys do an inadequate job of catching juvenile fish. The exceptional catch rates of recent years by fishermen causes them to conclude that recruitment is higher. In recent stock assessments there has been a tendency to underestimate age 1 and age 2 cod. For example, the 1996 year-class has been upgraded each year for the past two years. The FRCC recognizes that uncertainty exists regarding the inher-

Figures are in 000t

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC [2]	–	–	–	–	8	–	15	15	15	6	1	2	3	1.9	1.9
Catch	17.1	14.1	16.6	20.6	14.4	20.7	20.2	16.8	12.5	6	1	1.9	2.9	1.9	1.66

* Canadian catch as of April 19/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Canadian TAC

ent differences in catchabilities of cod and haddock by different gear types in the mixed fishery.

Since 1995, conservation and management measures have facilitated the estimated increase in biomass from 7500t to over 18,000t. It is apparent that the FRCC's objective of continued growth will not be realized in 2000. However, the Council believes that catches should be permitted to allow a limited mixed cod/haddock fishery to take place and ensure that important stock information will be maintained which will facilitate the continued assessment of this stock. The Council recognizes that such action will prolong the period of recovery for the cod stock and accepts this as a reasonable compromise in the short term. The stock status will have to be monitored closely until recruitment is substantial enough to contribute to the spawning stock biomass.

In view of this approach, the Council believes that a reduction in the actual total removals from 3000t in 1999 to a recommended level of 2000t in 2000 will not unduly compromise the stock. At this yield for 2000, the expected change in the age 3+ biomass as estimated by scientists is a 2% reduction, at a fully recruited exploitation rate of 8% or about one-half the equivalent $F_{0.1}$ exploitation.

The FRCC recommends that the total removals of 5Zjm cod for 2000 be set at 2,000t (combined Canadian/US total removals).

Sources

DFO Science

Eastern Georges Bank Cod. DFO Science SSR A3-04 (2000). 6p.

FRCC Consultations

The FRCC held consultations on this stock at Yarmouth on May 9, 2000 at the Grand Hotel.

Written Briefs

Inshore Fisheries Limited – Claude d'Entremont

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux

Scotia Fundy Inshore Fishermen's Association – Evan Walters

The <45' Shelburne County Fixed Gear Quota Group – Weldon Smith

Pubnico Ledge Fisheries - Frank d'Entremont

Council's views on Stock Status

Overall Stock Indicator:	stock above minimum but not growing, poor successive recruitment observations are causes for concern
Spawning Biomass:	decreasing and below the 25,000t minimum threshold
Total Biomass:	below long term average
Recruitment:	recovery since 1994 due to moderate year-classes in 1992 and 1995; 1997 and 1998 year-classes lowest observed
Growth and Condition:	weights-at-age remain below long-term average
Age Structure:	landings dominated by 1996 year-class at age 3
Distribution:	consistent over time
Recent Exploitation Level:	below $F_{0.1}$ since 1998.

The Council recognizes that management of the mixed fishery for cod and haddock poses special challenges for managers and industry. As the 5Zjm haddock stock on Georges Bank continues to increase, industry and DFO should investigate and implement every reasonable measure to improve the ability of industry to avoid or minimize the catch of cod during a directed haddock fishery.

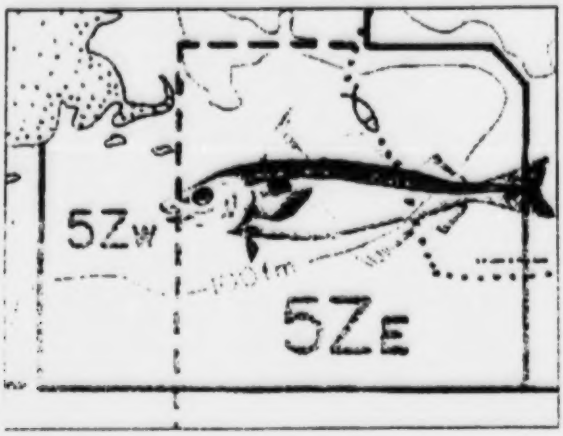
The FRCC recommends a continuation of the 100% dockside monitoring program and increases in at-sea enforcement to prevent dumping and discarding. Timely area and/or fleet closures should be implemented as necessary.

The FRCC also recommends expanded use of horizontal separator panels on all otter trawls in the directed haddock fishery to reduce the catches of cod; and continued use of management/industry subareas for refined management control throughout the fishery.

The FRCC notes that by the end of the 2000 fishing season, the industry/DFO Georges Bank longline survey will provide five years of additional information on stock status. The FRCC supports this joint initiative and anticipates the formal inclusion of the survey into future stock assessments.

The FRCC recommends that the industry/DFO Georges Bank longline survey continue to be carried out under consistent protocol so that it can be used as an index of abundance for future stock assessments beginning in 2001.

HADDOCK - 5ZJ,M



PERSPECTIVE

The haddock, a bottom dwelling species in the gadoid family, is found on both sides of the North Atlantic. In the western Atlantic, haddock range from Greenland to Cape Hatteras, with a major concentration on Eastern Georges Bank. On Georges Bank, young haddock grow rapidly at first, reaching over 50 centimeters (20 inches) by age 3, but grow slowly after, reaching about 75 centimeters (30 inches) by age 10. Many haddock mature by age 2 but it is uncertain if these young fish successfully produce viable eggs and larvae.

Georges Bank haddock have supported a commercial fishery since prior to 1900. Bottom trawlers have been the principal gear since their introduction in the 1920's. Landings from Georges Bank, which include the eastern Georges Bank component and the Great South Channel component, averaged about 46,000t between 1935 and 1960 and increased to over 100,000t in the 1960's under heavy exploitation. Subsequently, during the early 1970's, spawning season/area closures were introduced as a means of controlling effort and are still in use today. Following the extension of jurisdiction to 200 miles by coastal states in 1977, only Canada and the USA have fished this stock. Both Canada and the USA impose minimum fish size regulations. On Georges Bank, cod and haddock are transboundary and are caught together in a mixed groundfish fishery predominantly by mobile gear.

The fishery is closed to all sectors from January 1 to May 31 since 1994. Canadian landings have ranged from about 2000t increasing to 3600t from 1995 to 1999.

INTERIM STOCK OBJECTIVES

Pending consultation with industry on a long-term strategy for this stock as noted in the introduction, as in past reports, the Council set the following objectives:

- total removals based on exploitation below $F_{0.1}$;
- 40,000t interim threshold for spawning stock biomass (ages 3+) to improve the chances of good recruitment;
- an expected annual increase in biomass of 5 percent or more; and,
- a probability of decline in biomass (from the risk analysis) in the order of 20 percent or less.

ANALYSIS

Stakeholders expressed satisfaction with the continued rebuilding that took place over the past year. Industry recommendations for total removals were at the $F_{0.1}$ level of 8,800t and below. Industry advised that the FRCC make recommendations on total removals without taking into consideration management issues related to species mix in the cod, haddock, and yellowtail flounder fisheries on Georges Bank.

The stock is quickly approaching the 40,000t interim threshold in spawning stock biomass (ages 3+) which may be reached by 2001-2002. The Council recognizes the improvements made in this stock as a result of the conservation measures adopted by industry in recent years and encourages a continuation of these initiatives.

In 1999, the exploitation rate on fully recruited biomass was 12%, well below the equivalent $F_{0.1}$ exploitation rate of 20%. The spawning stock biomass increased by 20% from 1999 to 2000 due principally to the 1992 and 1996 year-classes but also supported by the 1991 and 1993 year-classes. The continued biomass increase is expected to be supported by the incoming 1998 year-class. The outlook for haddock on Georges Bank continues to be good and the population is responding positively to the low exploitation regimes in recent years.

While the biomass has increased since 1993, it remains below the long-term historical average dating from 1930s to 1950s. There is uncertainty about year-class abundance in the forecast results. There is also uncertainty due to variations in weights-at-age, partial recruitment to the fishery, and natural mortality. While

Figures are in 000t

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999*	2000	2001	2002
TAC [2]	–	–	–	–	8.2	–	5	5	5	3	2.5	4.5	3.2	3.0	3.0
Catch	5.2	5.6	6.1	6.7	4.1	4.8	6.4	5.6	4.3	2.4	2	3.4	2.8	3.4	3.0

* Canadian catch as of April 18/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Canadian TAC

conditions have improved, further stock rebuilding is required.

In light of these uncertainties, Council has difficulties with year-over-year recommendations that would double total removals from this stock and believes it is prudent to take a more measured approach.

Total removals for the entire stock area (5Zjm) of 6,000t is about 70% of the $F_{0.1}$ level of 8,800t. This level of catch will keep exploitation below $F_{0.1}$ and it is expected that this will increase the spawning stock biomass by more than 30%.

The FRCC recommends that the total removals of 5Zjm haddock for 2000 be set at 6,000t (combined Canadian/US total removals).

Council's Views on Stock Status

Overall Stock Indicator:	recovering
Spawning Biomass:	near 40,000t threshold
Total Biomass:	increasing since 1993 but remains below long term average level
Recruitment:	sporadic; 1992 and 1996 year-classes moderate while 1997 was weaker; the 1998 year-class appears to be strong and the preliminary information on the 1999 year-class indicates that it is moderate
Growth and Condition:	average growth; age 1 survivorship is generally higher than observed during the 1980's
Age Structure:	broad age structure is reflected in both the fishery and the catch
Distribution:	similar to recent past
Recent Exploitation Level:	below $F_{0.1}$ since 1995

Sources

DFO Science

SSR A3-08 (2000) Haddock on Georges Bank.

FRCC Consultations

The FRCC held consultations on this stock at Yarmouth on May 9, 2000 at the Grand Hotel.

Written briefs

Inshore Fisheries Limited – Claude d'Entremont

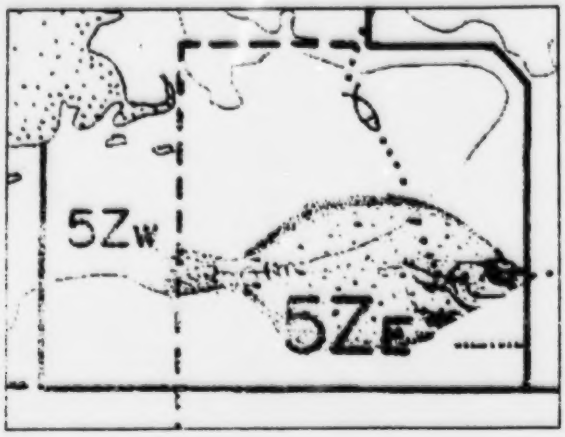
Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux

Scotia Fundy Inshore Fishermen's Association – Evan Walters

The <45' Shelburne County Fixed Gear Quota Group – Weldon Smith

Pubnico Ledge Fisheries - Frank d'Entremont

YELLOWTAIL FLOUNDER - 5ZJMHN



PERSPECTIVE

Yellowtail flounder populations range from Labrador to Chesapeake Bay and are considered relatively sedentary. A major concentration of yellowtail flounder occurs on Georges Bank to the east of the Great South Channel. While tagging work indicates limited movement from Georges Bank to adjacent areas, knowledge of seasonal movement of yellowtail flounder on Georges Bank is poor.

On Georges Bank, spawning occurs during the late spring period peaking in May. It appears that spawning occurs on both sides of the international boundary. Yellowtail flounder appear to have variable maturity schedules, with age two females considered 40% mature during periods of high stock biomass to 90% mature during periods of low stock biomass.

Total catches of Georges Bank yellowtail flounder reached almost 20,000t in the late 1960s. The Canadian directed fishery for yellowtail flounder is a relatively recent development, with significant catches first occurring after the introduction of specialized gear in 1993. In 1994, with about 40 vessels pursuing the Canadian fishery there was a catch of 2,142t. Under quota control for the first time in 1995, Canadian catches were 495t against a quota of 400t. The combined Canada-USA catch has been increasing since 1995, and in 1999 was 4,441t with Canada taking 1,971t of its 2,000t quota.

The Canadian fishery is mainly pursued using otter trawl gear from vessels less than 65'. The fishery occurs in a relatively limited portion of Georges Bank known as the Yellowtail Hole (5Zm), and with current management restrictions, operates in the latter half of the calendar year only. Both Canada and USA employ the same management unit.

INTERIM STOCK OBJECTIVES

Pending consultation with industry on a long-term strategy for this stock as noted in the introduction, as in past reports, the Council set the following objectives:

- total removals based on exploitation below $F_{0.1}$;
- an expected annual increase in spawning stock biomass of 5 percent or more; and
- a probability of decline in biomass (from the risk analysis) on the order of 20 percent or less.

ANALYSIS

In 1999, the exploitation rate on fully recruited biomass was 12%, well below the equivalent $F_{0.1}$ exploitation rate of 20%. The spawning stock biomass virtually doubled in part due to the increased estimate of the very large 1997 year-class in 2000. The outlook for yellowtail flounder on Georges Bank continues to be good and the population is responding positively to the low exploitation regimes.

Mobile gear reported increasing catch rates in this fishery, despite using traditional groundfish gear as opposed to gear specially designed to catch flatfish. Industry also noted an increasing spatial distribution of the resource which was considered a positive sign.

Industry advised that the FRCC make recommendations on total removals without taking into consideration management issues related to species mix in the cod, haddock, and yellowtail flounder fisheries on Georges Bank. Total removals recommendations ranged from 7,800t to 8,000t at $F_{0.1}$.

The phenomenal rate of increase observed this year is not expected to continue in the future. Recent recruitment is strong relative to the 1980s, and the 1997 year-class appears to be the strongest since 1973. The 1997 year-class is expected to contribute 42% to the exploitation in the 2000 fishery and 43% of the total biomass.

The FRCC is concerned about the few older age groups in the population. A consequence of the large 1997 year-class is an opportunity to expand the age structure in the population by increasing the percentage of older fish in the population.

Figures are in 000t

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999*
TAC [1]	–	–	–	–	–	–	–	–	0.43	0.43	0.8	1.2	2
Catch [2]	–	–	–	–	–	–	–	0.2**	1	0.48	0.4	0.78	1.14	1.88

* Canadian catch as of April 18/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Canadian TAC

Total removals of 6,000t in 2000 would result in a negligible probability that the biomass will decline in 2001, and are consistent with the FRCC's objectives for stock growth. This catch level allows expected growth in biomass of 15% and an exploitation rate of 15%, below the equivalent $F_{0.1}$ exploitation rate of 20%.

The FRCC recommends that the total removals of 5Zjmnh yellowtail flounder for 2000 be set at 6,000t (combined Canadian/US total removals).

The FRCC noted that continued low levels of sampling and absence of age information have compromised reliability of the stock assessment results. The FRCC is pleased to note that DFO Science intends to improve aging capability to deal with this deficiency.

The FRCC recommends that increased yellowtail flounder sampling work be conducted to improve the reliability of stock assessment results.

In last year's report, the Council noted the potential impact of the Canadian scallop fishery on yellowtail flounder. Information on this by-catch was not tabled at the TRAC meeting for the Canadian scallop fleet. DFO subsequently informed the Council that their preliminary investigation indicates that this problem is negligible.

In order to ensure the conservation of this resource, the FRCC recommends that information on yellowtail flounder catches and/or discards in the Canadian scallop fishery be tabled and incorporated in the next stock assessment.

Sources

DFO Science

SSR A3-15 (2000) Yellowtail flounder on Georges Bank.

FRCC Consultations

The FRCC held consultations on this stock at Yarmouth on May 9, 2000 at the Grand Hotel.

Written briefs

Inshore Fisheries Limited – Claude d'Entremont

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux

Scotia Fundy Inshore Fishermen's Association – Evan Walters

The <45' Shelburne County Fixed Gear Quota Group – Weldon Smith

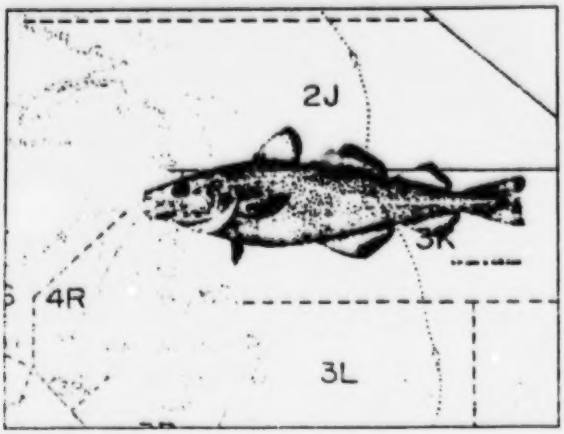
Pubnico Ledge Fisheries – Frank d'Entremont

Council's Views on Stock Status

Overall Stock Indicator:	rebuilding
Spawning Biomass:	rebuilding
Total Biomass:	rebuilding
Recruitment:	moderate/strong year-classes in 1990's; the 1997 year-class estimated to be strong at over 80 million fish
Growth and Condition:	increasing trend from 96 to present
Age Structure:	expanding
Spatial Distribution:	expanding
Recent Exploitation Level:	below $F_{0.1}$

2J3KL Cod

COD - 2J3KL



PERSPECTIVE

The northern cod (NAFO divisions 2J3KL) stock was and potentially remains the largest groundfish resource in the Northwest Atlantic Ocean. The stock inhabits an area of approximately 400,000 square km. Historically, cod in abundance migrated from over-wintering shelf areas to feeding areas in coastal waters. The fishery was traditionally prosecuted by a large fleet of small vessels that deployed traps, gillnets, and hook and line in more coastal waters from late spring to autumn. From the 1960s until the fishing moratorium large otter trawlers prosecuted the fishery in offshore waters, mainly through winter and early spring.

Cod in areas 2J3KL grow relatively slowly and at age five reach about 50 cm (20 inches). Cod prey on a wide variety of species, particularly capelin. The northern cod stock has supported a commercial fishery since the 16th century. In the decades prior to the 1960s catches ranged between 200-300,000 tonnes annually. Catches increased to over 800,000 tonnes in the 1960s and the stock declined until the mid -1970s. After the extension of jurisdiction in 1977, the stock increased until the mid -1980s but has since declined to a very low level. Over-fishing and unfavourable environmental conditions may explain the collapse of the stock that occurred in the early 1990s.

ANALYSIS

STOCK STRUCTURE AND DISTRIBUTION

The stock structure of 2J3KL cod changed significantly during the late 1980s and early 1990s. Abundance declined very sharply and the decline continued after the cessation of the commercial fishery in 1992. The distribution of cod reflects a very low abundance in the shelf components and the only concentration of cod is located in the coastal areas of Trinity and Bonavista Bays. Genetic studies suggest that the shelf-spawning components differ from the populations in the coastal area. The populations in the coastal areas are more similar to one another than to the shelf components. The genetic differences are small, and there is inconclusive evidence that they are stable over time. Therefore, the meaning of these differences remains uncertain. **Distribution expansion is key to stock recovery and we must assume that the more sub-components expand, the more likely stock productivity will increase.**

The FRCC recommends that 2J3KL cod be managed on a long-term basis with the objective of rebuilding the sub-stock structure to include the full range, both in the coastal area and on the shelf, from the northern Grand Bank to the Hamilton Bank.

The only known large over-wintering and spawning concentration of cod occurs in Smith Sound, Trinity Bay. At present, this aggregation is unique and may be key to the recovery of coastal sub-components and perhaps beyond. Recent acoustic surveys in Smith Sound indicate an average biomass estimate of about 22,000 tonnes. Several year-classes since 1990 are well represented in this aggregation and are similar to those represented in the commercial fishery. Fish spawn in the area (and potentially in other areas) and migrate from the Sound and northward during late spring and summer. These fish return to the Sound in late autumn where they over-winter. Observations from fishers are consistent with this migration pattern.

The FRCC believes that management measures introduced in 1999 were effective in protecting fish aggregated in Smith Sound. However, the small size of the protected area led to a concentration of fishing effort adjacent to the entrance to the Sound.

The FRCC recommends introduction of a buffer zone of 5 nautical miles around Smith Sound where only local resident fishermen would be permitted to fish.

Tag returns from the fishery in 1999 were highest in area 3K (26%), lowest in northern 3L (7%), and at an intermediate level in southern 3L (11%). Many of the

Figures are in 000t

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
TAC [2]	266	266	266	266	236	190.3	190	Moratorium				4	8
Catch	226.1	274.7	245	266.7	254.1	223.6	188	58.3				1.5	5.07

* Canadian catch as of April 18/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish
2. Canadian TAC

recoveries of tags applied in southern 3L occurred in 3Ps, suggesting these fish were migrants into 3L.

Information from recaptures of cod tagged in 3KL during 1997 through 1999 was used to estimate exploitation rates. When combined with catches recorded for each area, these exploitation rates indicate that cod biomass is approximately 10,000t in 3K and 45,000t in northern 3L. Estimates could not be derived for southern 3L due to the presence of cod from 3Ps.

The FRCC recommends that the tagging program be expanded to include all stock areas (northern 3K and 2J). In addition, the acoustic surveys in coastal areas should be continued for the foreseeable future. These programs are instrumental in monitoring the status of the coastal components of the northern cod stock.

DFO conducts bottom trawl surveys each fall on the shelf and Banks of 2J3KL. The abundance index from

Sources

DFO Science

SSR A2-01 (2000) Northern(2J3KL) Cod

FRCC Consultations

The FRCC held consultations on this stock in:

Grand Falls, NF (April 18)
Clarenville, NF (April 19)
St. John's, NF (April 20)

Written briefs

Thomas Barnes, Fogo Island Fisherman

Aubrey Payne, Fogo Island Fisherman

Fish, Food and Allied Workers – Harvey Jarvis

Wilfred Bartlett, Retired Fisherman, Brighton, NF

3K Small Boat Action Committee – Ray Wimbleton

Hayward Pike, Fisherman, Bonavista Bay

Fish, Food and Allied Workers – Earle McCurdy

Southern Shore Inshore Fishermen's Action Committee – George Chafe

Petty Harbour Fishermen's Co-operative – Tom Best

Fred Winsor

George Feltham

Fisheries Association of Newfoundland and Labrador – Alistair O'Rielly

Council's Views on Stock Status

Overall Stock Indicator:	stock at very low level, some improvement in 1999
Overall biomass:	very low relative to historical levels (3%). Pockets of very high density in coastal areas
Recruitment:	some improvement in coastal areas, very low in shelf components
Growth and Condition:	growth improving, condition good
Age Structure:	very poor in the shelf components (unexplained declines in fish at about age 5), improving in the coastal area, but few fish older than 10 years
Distribution:	poor in the shelf and northern coastal areas, improving in coastal 3L
Recent Exploitation Level:	unknown in 2J, high in southern 3K, moderate in 3L

this survey increased in 1999 from 1998. The increase occurred in 3K and 3L but not in 2J. As in previous years there were very few fish older than 5 years and most of the increase was attributed to fish at ages 2 and 3. Overall the biomass index in 1999 was only about 3% of the average in the period 1983 to 1988. The consensus of the industry is that there are very few cod in the shelf components of the stock and the overall level of abundance remains extremely low.

The FRCC recommends that the moratorium on fishing the shelf and Bank sub-components of 2J3KL continue for the foreseeable future.

Sentinel Fishery

The sentinel fishery in 2J3KL has been conducted since 1995 to provide an index of cod catch rates in coastal waters. These surveys continue to indicate low catch rates in areas 2J and 3K north. Gillnet catch rates increased from 1995 to 1998 and declined in 1999. Line trawl catch rates remained relatively unchanged in the period 1995 to 1996, increased in 1997, and declined again in 1998 and 1999. The catch rates at age indicate the 1990 and 1992 year-classes to be strongly represented and that year-classes subsequent are weaker. The FFAW in conjunction with fishermen committees conducted a questionnaire, the results of which indicate that the sentinel survey catch rates reflected the observations of fishermen in various areas. Many fishermen (43%) indicated that catch rates were low. These responses were very consistent with the areas where the commercial catches in coastal areas were also low i.e. area 2J, northern 3K, eastern Trinity Bay and Conception Bay, particularly. Other responses from fishers indicated average catch rates (37%), and high catch rates (22%). High catch rate responses reflected sentinel sites in the area from the most eastern coastal part of 3K to the area of Smith Sound in western Trinity Bay. Fishermen noted that there are several important coastal areas where there is inadequate site monitoring and the level of sentinel surveying is declining.

The FRCC recommends that the sentinel fishery continue and effort be made to expand the number of sites and coverage to ensure the survey is adequate over space and time.

Biological Factors and Recruitment

The age at which northern cod reach maturity continues to be low relative to the early 1980's. The proportion of age six cod that are mature currently is about 80%. This is double the level in the 1980's when only about 40% were mature. The size-at-age of cod has increased in recent years and is similar to values in the 1980's. Some 90% of fishermen, as indicated by the FFAW questionnaire results, reported that the overall condition of cod caught during 1999 was good.

A recruitment index was derived from inshore sentinel data as well as other data from offshore and inshore surveys during the period of the 1990's. The index reflects declines from 1989 to1991, an increase in 1994, declines to 1996, and then increases to 1999. The estimates for the most recent years, 1998 and 1999, must be viewed with caution, as their relationship to ultimate year-class strength remains uncertain. It is noteworthy that the dominant 1992 year-class present in the stock structure is not well represented in the recruitment index. The responses from fishermen to the questionnaire as to whether they observed more, the same, or less small (<18 inch) cod in 1999 as compared to 1998, indicated 50% noting more, 34% noting the same, and 16% stating less.

During 1999, the fishery was prosecuted mainly through the deployment of gillnets. The dominant use of this gear type is of concern to the FRCC. Measures should be introduced to provide for a more traditional balance in the use of various gear types in coastal areas.

During 1999, fishing occurred in two seasonal periods. The first was during July (about 3 weeks), and the second season occurred from mid-September to November. This timing is consistent with traditional fishing patterns in the coastal areas of 2J3KL cod. The Council is of the view that fishing should be spread over space and time to the greatest degree possible within the traditional fishing period. The 2J3KL cod stock becomes highly aggregated during winter and through the spring spawning season and in this period is very vulnerable to fisheries. At present the remaining aggregations occur in accessible coastal areas such as Smith Sound and the inner portions of Bonavista Bay. Fishing should be avoided during periods of highest aggregation and spawning.

The FRCC recommends that cod fishing in coastal 2J3KL take place only during the period June 1 to November 30.

To the greatest extent possible, juvenile cod should be protected to allow them to surpass spawning age prior to being harvested at a significant level by the fishery.

The FRCC recommends that the small fish protocol be applied to the 2J3KL cod stock.

Predation and prey

Mortality of northern cod caused by seals continues to be a major concern of the FRCC. Revised consumption estimates for 1998 are approximately 50,000t. Mortality inflicted by "belly-feeding" is not included in these estimates, and continues to be observed in several coastal areas, particularly in Bonavista Bay. Cod overwintering in coastal areas are very vulnerable to predation mortality, especially given the cold waters which slow cod metabolism and expose them to the risk of freezing if chased into sub-zero temperatures.

During the FRCC's consultations, fishermen continued to express concern with regard to seal predation and many fishermen expressed deep frustration by the lack of action by DFO to address this ongoing problem. Fishermen expressed the view that the ecosystem is out-of-balance, that there are too many seals relative to cod, and that seals are being observed in the coastal area over extended periods of time. Fishermen are frustrated by the lack of scientific information with respect to the impact that seals are having on the recovery of cod. They note that scientists continue to conclude that cod recruitment is generally poor and that cod on the shelf are not living beyond five years, but scientists cannot specify the cause. Fishermen conclude that seals are reducing the spawning potential of the stock. Fishermen are recommending that appropriate steps be taken to authorize the control of seals in limited areas where seals are destroying cod in large numbers.

The FRCC recommends that areas be identified where cod are aggregated during winter or where seals are inflicting high mortality on cod, and these areas be designated as seal exclusion zones. Within these areas, measures must be taken immediately to protect and conserve cod.

The FRCC is concerned about ecosystem processes that affect this stock. Oceanographic conditions have warmed considerably in the past few years from the cold years of the early 1990s. However, the trend in biomass of capelin, the major prey of cod in this area, has been uncertain since the late 1980s. The SSR indicates that the tendency for cod to move from the coastal to the Bank regions may be greater if capelin biomass increases both on the shelf and to the north. Recent acoustic surveys have detected several concentrations of capelin in the coastal area but few offshore compared to the period of the 1980s.

Many fishermen expressed similar views on the ecosystem. Most fishermen believe that capelin are at a low level relative to historical times, that elevated numbers of seals may be impacting capelin stocks, and that increases in capelin would enhance the likelihood that cod stocks would increase. In particular, many fishermen believe that the abundances of capelin and cod are intrinsically linked and that cod will only recover when capelin is again abundant in all areas of 2J3KL.

The Council is also concerned about the sub-stock structure of the 2J3KL stock and the impact that uncertainties about this structure are having on current fisheries and rebuilding strategies.

The FRCC recommends that interactions and relationships between capelin, seals, the physical environment and the sub-stock structure and productivity of 2J3KL cod be better understood. DFO must improve its commitment to science in this regard so that specific information can be provided on the effect that these factors are having on the rebuilding of northern cod.

Conclusions

Historically, the shelf components of the 2J3KL cod stock migrated to the coastal zones in the spring and summer. Indeed, these annual migrations supported the large seasonal coastal fishery and determined the success of the fishery in many bays and inlets along the northeast coast Newfoundland. The rebuilding of these shelf components and a renewed migration are critical to the long-term prosperity of the coastal fishery. Therefore, it is very important that a fishery of any nature consider the possible exploitation on rebuilding shelf sub-components. The recent DFO Stock Status Report states "It is certain that the inshore fishery will not return to its former prominence until such time as a substantial biomass of cod builds up in the offshore and these fish resume a summer feeding migration to the inshore." **The FRCC supports this conclusion and its future recommendations will reflect a sustainable approach that considers the inherent sub-components of the stock.**

The importance of a small vessel coastal fishery and the scientific data provided by it are recognized by the FRCC. The provision of fishery data from fishermen's logbooks on spatial and temporal distribution, catch rates, age and weight of year-classes is an essential element in monitoring and ensuring the rebuilding of this stock. The coastal estimates of abundance from tagging data require tag returns from the fishery. Therefore, the FRCC believes that all fisheries for this stock must contribute to the monitoring of stock status and be of scientific value. The sentinel fishery must

continue, but by itself is insufficient to provide monitoring of the full fishery. All stock removals must be utilized to the greatest extent possible in terms of improving knowledge and assisting the rebuilding of this stock.

Fishermen have varying views about the state of the northern cod stock. However, the views expressed overall are consistent with the findings and conclusions provided by scientists in many areas:

- shelf components are very low;
- northern coastal components are also very low;
- catch rates are reasonably good in southern 3K reflecting the presence of coastal fish, however, scientists report that exploitation is high in this area;
- catch rates are high in northern 3L consistent with the relatively large coastal aggregation over-wintering in the area;
- catch rates are highly variable in southern 3L as a consequence of the migration of cod from 3Ps. Scientists were unable to provide an estimate of a resident stock due to the transient presence of cod from the more southern zone in this area.

Fishers are generally of the view that the region from southern 3L to southern 3K can support a commercial fishery at or above the level of 1999. However, this view is not universal.

The FRCC has considered the views of fishermen and the Stock Status Report and recommends that the exploitation of cod in coastal areas be kept low to secure growth in the spawning biomass. The best estimate of the total biomass in coastal 3KL is approximately 55,000t. In addition, it is recognized that a component of fish historically caught in southern 3L were migratory from 3Ps. The best estimate available of the total average biomass of these fish in recent years is approximately 15,000t.

The FRCC recommends that only sentinel and index fisheries be prosecuted in 3KL. Sentinel fisheries only must be prosecuted in 2J. The total fishing exploitation from all sources in 2J3KL should not exceed a rate of 10%. Therefore, the FRCC recommends that total catch for coastal 2J3KL should not exceed 7,000t.

The FRCC also recommends that no more than 80% of the total be taken in northern 3L and 3K (the balance should be harvested in southern 3L). In addition, the FRCC recommends that the migration of cod and allocation between 3Ps and southern 3L be reassessed by DFO, in recognition that historical catches in southern 3L were dependent on migratory fish from 3Ps.

The "food" fishery in Newfoundland has a very high overall level of effort with participation estimated at about 23,000 vessel days. The harvest potential of this effort is very much impacted by weather and seasonal availability. If continued, this effort could account for up to 15% of the total catch of all fishing at current levels.

The FRCC supports only those fisheries that return the maximum information to science and management. The 2J3KL "food" fishery does not meet these criteria and therefore should not be continued at the present time.

The FRCC does not foresee any significant change in the recommended exploitation of this stock until there is significant improvement in stock distribution and abundance, especially in terms of spawning stock and recruitment. It is expected that the strategy of keeping exploitation rates at a low level in the short term will have a pay-off to fishermen and industry within a reasonable time, in terms of higher levels of biomass and harvest. The FRCC believes that allowing higher levels of exploitation in the short term will jeopardize stock rebuilding and the opportunity to re-establish a commercial coastal fishery.

Long-term Plan for Northern Cod

The FRCC is in the process of developing a long-term plan for the rebuilding of the northern cod stock. The plan will set out specific objectives to guide the Council in making recommendations on this stock. Once a draft plan is complete, the Council will be circulating it for public input prior to it being adopted. The plan will seek to establish goals with respect to:

- stock distribution and structure;
- long-term target levels for population growth, biomass and harvest;
- conservation regimes for the stock and its subcomponents;
- the ecosystem in which the stock is a part;
- the time frame upon which rebuilding may occur.

Appendix 1: Letter to Stakeholders

LETTER TO STAKEHOLDERS

April 26, 2000

Dear Stakeholder in the Georges Bank Groundfish Fishery:

RE: Georges Bank 1999 Fishery Questionnaire

Please find attached a questionnaire to provide feedback to the Fisheries Resource Conservation Council (FRCC) on your experience in the Georges Bank fishery of 1999.

The FRCC requests that participants in the 1999 Georges Bank groundfish fishery take a few minutes to complete the questionnaire. As well, any comments and suggestions toward formalizing information the FRCC receives from fishermen are most welcome.

This questionnaire is being tested as a means to providing more structured information on fishing industry observations. It is designed to make it easier for respondents to provide feedback on their observations in the fishery by simply checking the most appropriate boxes in response to questions on stock status and fisheries observations. It is estimated that all respondents can complete all questions in less than 10 minutes. As such, it is our objective to have as many people as possible complete the form in order to obtain an industry view of the Georges Bank groundfish stocks.

We believe that fishermen's information gathered in this form will be the beginning of developing much needed structure for industry's view of stock status, and together with other sources of information, will provide important rationale to the FRCC's recommendations to the Minister of Fisheries and Oceans.

Your completed questionnaires can be sent:

By fax:	(613) 998-1146
By mail:	P.O. Box 2001, Station D, Ottawa, ON K1P 5W3
By E-mail:	**sheehant@dfo-mpo.gc.ca**
By hand:	FRCC Consultation, Rodd's Grand Hotel, Yarmouth, May 9, 2000

The questionnaire can also be found on the FRCC website at: www.ncr.dfo.gc.ca/frcc. Completed questionnaires should be received by the FRCC prior to May 5, 2000.

Thank you in advance for your feedback and your contribution toward better understanding the status of groundfish resources on Georges Bank.

Yours truly,

Fred Woodman
Chairman

Questions to Participants in the 1999 Georges Bank Groundfishery

The FRCC has developed the following questionnaire as an important part of its information sources for determining stock status of the Georges Bank groundfish resources of cod, haddock, and yellowtail flounder. Once compiled, this information is used to assist the FRCC in making recommendations to the Minister of Fisheries and Oceans for the year 2000/2001 fishery.

Instructions to participants: Please complete the following questions by checking off the appropriate box (✓) in the tables below. Additional written comments are welcome. The questionnaire should take about 5 to 10 minutes to complete. Thank you in advance for your valuable input.

I. Stock Status

1. What is your view of the **overall status in 1999** of groundfish stocks on Georges Bank?

	Fully recovered	Improving compared to 1998 but not fully recovered	Stable-unchanged from 1998	Declining compared to 1998	Stock in collapse
5Zjm Cod					
5Zjm Haddock					
5Zjmnh Yellowtail flounder					

2. How did your own **catch rates in 1999** compare with your catch rates of 1998?

	Highest ever	Better than 1998	Unchanged from 1998	Worse than 1998	Lowest ever	Did not fish stock
5Zjm Cod						
5Zjm Haddock						
5Zjmnh Yellowtail flounder						

3. How **available were fish in 1999** compared with fish availability in 1998?

	Easy to find	Easier to find than 1998	Unchanged from 1998	More difficult to find than 1998	Difficult to find	Did not fish stock
5Zjm Cod						
5Zjm Haddock						
5Zjmnh Yellowtail flounder						

4. How did the **timing of the fishery in 1999** compare with the timing of the fishery in 1998?

	Very early	Earlier than 1998	Unchanged from 1998	Later than 1998	Very late	Did not fish stock
5Zjm Cod						
5Zjm Haddock						
5Zjmnh Yellowtail flounder						

5. What was the **overall condition of fish in 1999** catches compared to fish condition in 1998?

	Excellent fish condition	Improved condition compared to	Unchanged condition from 1998	Declining condition compared to	Poor fish condition	Did not fish stock

		1998		1998		
5Zjm Cod						
5Zjm Haddock						
5Zjmnh Yellowtail flounder						

Instructions to participants: Please complete the following questions by checking off the appropriate box (✓) in the tables below. Additional written comments are welcome.

II. Observations while Fishing in 1999

1. How would you evaluate the **overall status of the Georges Bank ecosystem in 1999** (e.g., environmental conditions, water temperature, salinity, presence of other species, etc.) ?

	Highly positive	Better than in 1998	Unchanged from 1998	Deteriorated compared to 1998	Highly negative
Georges Bank ecosystem					

Please state evidence from indicators you observed in support of your response:

---

2. Did the presence of **predator species** on groundfish have an impact on the fishery in 1999?

	High abundance of predators	Increased predators compared to 1998	Unchanged predators from 1998	Decreased evidence of predators compared to 1998	Relative absence of predators
Predator species					

Please state evidence of predator abundance you observed in support of your response:

---

3. Did the presence of **prey (forage) species** (e.g., sandlance, herring, shrimp, etc.) for groundfish have an impact on the fishery in 1999?

	High abundance of prey	Increased prey compared to 1998	Unchanged prey from 1998	Decreased evidence of prey compared to 1998	Relative absence of prey
Prey species					

Please state evidence of prey abundance you observed in support of your response:

---

4. How would you evaluate the **age distribution of fish** in catches by stock in 1999?

	Many more small fish	More small fish than usual	Similar in ages and size to past years	More big fish than usual	Many more older, big fish	Did not observe
5Zjm Cod						
5Zjm Haddock						
5Zjmnh Yellowtail flounder						

5. Were the **Dockside Monitoring Program (DMP) and observer coverage effective** in dealing with stock conservation concerns (e.g., discarding, misreporting,etc.) on Georges Bank in 1999?

	Very Effective	Partly effective	Uncertain	Less than fully effective	Not at all effective
DMP and observer coverage effectiveness					

Suggestions to improve monitoring effectiveness:

Instructions to participants: Please complete the following questions by checking off the appropriate box (✓) in the tables below. Additional written comments are welcome.

III. Resource Outlook

In its 1999 recommendations for the Georges Bank groundfish stocks, the FRCC presented a series of criteria for stock conservation and growth. These included: (1) recommending quotas below the $F_{0.1}$ level; (2) stock specific spawning stock biomass targets; and (3) maximum acceptable probabilities of 20% for decline in the spawning stock biomass. In the year 2000 the FRCC will be consulting DFO and the fishing industry to develop longer-term plans for the Georges Bank groundfish stocks. At this time, we invite you to provide preliminary feedback on the planning process, and criteria for stock conservation and growth.

Comments on **long-term planning for Georges Bank** groundfish stocks:

IV. Respondent's Information

1. To what **fleet/gear sector** do you belong?

	FG less than 45'	FG 45'-65'	MG less than 65'	FG 65'-100'	MG 65'-100'	Vessels>100'
Fleet/Gear sector						

2. What **Georges Bank groundfish stocks** did you fish in 1999? *(Check all that apply.)*

	5Zjm Cod	5Zjm Haddock	5Zjmnh Yellowtail flounder
Stocks fished			

3. In what **periods did you fish for Georges Bank** groundfish in 1999? *(Check all months that you fished.)*

	June	July	August	September	October	November	December
Fishing periods							

4. How many **years experience** do you have fishing Georges Bank groundfish stocks?

	One year	2 to 5 years	5 to 7 years	7 to 10 years	More than 10 years
Years experience					

Comments on **questionnaire and suggestions for improving industry information** collection:

Thank you for taking the time to complete this questionnaire. Please send completed questionnaire to:

By fax: (613) 998-1146
By mail: P.O. Box 2001, Station D, Ottawa, ON K1P 5W3
By E-mail: sheehant@dfo-mpo.gc.ca

Appendix 2: FRCC Mandate and Membership

FRCC Terms of Reference

1. Introduction

The Government of Canada is committed to a more comprehensive approach to the conservation and management of our fisheries resource. This approach demands a better understanding of complex fisheries ecosystems - the interaction of fish with other species, predator-prey relationships, and also changes in the marine environment like ocean currents, water temperatures and salinity.

The Government of Canada is also committed to a more effective role in decision-making for those with practical experience and knowledge in the fishery.

The Minister of Fisheries and Oceans has established the Fisheries Resource Conservation Council (FRCC) as a partnership between government, the scientific community and the direct stakeholders in the fishery. Its mission is to contribute to the management of the Atlantic fisheries on a 'sustainable' basis by ensuring that stock assessments are conducted in a multi-disciplined and integrated fashion and that appropriate methodologies and approaches are employed; by reviewing these assessments together with other relevant information and recommending to the Minister total allowable catches (TACs) and other conservation measures, including some idea of the level of risk and uncertainty associated with these recommendations; and by advising on the appropriate priorities for science.

2. Definition of Conservation

Fisheries conservation is that aspect of the management of the fisheries resource which ensures that its use is sustainable and which safeguards its ecological processes and genetic diversity for the maintenance of the resource. Fisheries conservation ensures that the fullest sustainable advantage is derived from the resource and that the resource base is maintained.

3. Council Objectives

3.1 To help the government achieve its conservation, economic and social objectives for the fishery.The conservation objectives include, but are not restricted to:

3.1.1 rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish; and,

3.1.2 managing the pattern of fishing over the sizes and ages present in fish stocks and catching fish of optimal size.

3.2 To develop a more profound understanding of fish-producing ecosystems including the inter-relationships between species and the effects of changes in the marine environment on stocks.

3.3 To review scientific research, resource assessments and conservation proposals, including, where appropriate, through a process of public hearings.

3.4 To ensure that the operational and economic realities of the fishery, in addition to scientific stock assessments, are taken into account in recommending measures to achieve the conservation objectives.

3.5 To better integrate scientific expertise with the knowledge and experience of all sectors of the industry and thus develop a strong working partnership.

3.6 To provide a mechanism for public and industry advice and review of stock assessment information.

3.7 To make public recommendations to the Minister.

4. Mandate and Scope

4.1 The Fisheries Resource Conservation Council will address these objectives by bringing together industry, DFO science and fisheries management, and external scientific and economic expertise in one body.

4.2 The Council will:

4.2.1 advise the Minister on research and assessment priorities;

4.2.2 review DFO data and advise on methodologies;

4.2.3 consider conservation measures that may be required to protect fish stocks;

4.2.4 review stock assessment information and conservation proposals, including through public hearings, where appropriate; and,

4.2.5 make written public recommendations to the Minister on TACs and other conservation measures.

4.3 The Council may recommend any measures considered necessary and appropriate for conservation purposes such as TACs, closure of areas to fishing during specific periods, approaches to avoid catching sub-optimal sized fish or unwanted species, and restrictions on the characteristics or use of fishing gears.

4.4 The Council's scope includes Canadian fish stocks of the Atlantic and Eastern Arctic Oceans. In the first instance, the Council will address groundfish, and then subsequently take on responsibility for pelagic and shellfish species.

4.5 The Council may also advise the Minister on Canada's position with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO).

5. Size, Structure and Make-Up

5.1 The Council will consist of not more than 14 members with an appropriate balance between 'science' and 'industry'.

5.2 Members are chosen on merit and standing in the community, and not as representatives of organizations, areas or interests.

5.3 'Science' members, are drawn from government departments, universities or international posts, and are of an appropriate mix of disciplines, including fisheries management and economics.

5.4 'Industry' members are knowledgeable of fishing and the fishing industry and understand the operational and economic impacts of conservation decisions.

5.5 All members of the Council are appointed by the Minister.

5.6 All members, including the Chairperson, are appointed for a three year term; terms can be renewed.

5.7 Members appointed from DFO serve 'ex officio'.

5.8 Members have to disclose any interest in the Atlantic or Eastern Arctic fishery and take appropriate measures so as to avoid potential or real conflict of interest situations during the term of appointment.

5.9 The four Atlantic Provinces, Quebec and the Northwest Territories may each nominate one delegate to the Council. These delegates have access to the Council's information, and may participate fully in meetings, but will not be asked to officially endorse the formal recommendations to the Minister.

5.10 The Council is supported by a small Secretariat, to be located in Ottawa. The Secretariat will:

5.10.1 provide administrative support for the functioning of the Council;

5.10.2 provide a technical science and fisheries management support;

5.10.3 organize Council meetings;

5.10.4 record decisions of the Council;

5.10.5 undertake a professional communications function for the Council, providing a central point for communications to and from the Council; and

5.10.6 undertake such other matters as from time to time might be appropriate.

5.11 The Chairman may appoint an Executive Committee, consisting of the Chairman, Vice-Chairman, and three other Members.

5.12 In addition, the Chairman may, from time to time, strike an 'ad hoc' committee to deal with a specific issue.

6. Activities:

6.1 Reviews appropriate DFO science research programs and recommends priorities, objectives and resource requirements.

6.2 Considers scientific information - including biology, and physical and chemical oceanography, taking into account fisheries management, fishing practices, economics and enforcement information.

6.3 Conducts public hearings wherein scientific information is presented and/or proposed conservation measures/options are reviewed and discussed.

6.4 Recommends TACs and other conservation measures.

6.5 Prepares a comprehensive, long-term plan and a work plan for the Council which are reviewed annually at a workshop with international scientists and appropriate industry representatives.

6.6 Ensures an open and effective exchange of information with the fishing industry and contributes to a better public understanding of the conservation and management of Canada's fisheries resource.

FRCC MEMBERSHIP:

MEMBERS:

Fred Woodman, Chairman
Jean-Claude Brêthes, Vice-Chair
William Broderick
Osborne Burke
Bruce Chapman
Ernest Després
Jean Guy d'Entremont
Gabe Gregory
Frank Hennessey
Dan Lane
Edward McAlduff
John Pope
George Rose
Louis Schofield
Maureen Yeadon

PROVINCIAL DELEGATES:

Ray Andrews, Nunavut
Yvon Chiasson, New Brunswick
David Gillis, Prince Edward Island
Dario Lemelin, Québec
Tom Dooley, Newfoundland and Labrador
Clary Reardon, Nova Scotia

EX OFFICIO:

Guy Beaupré
Denis Rivard
Barry Rashotte

SECRETARIAT:

Michel G. Vermette, Executive Director
Tracey Sheehan
Debra Côté
Helena Da Costa
Marny Brown

200 Mile Fishing Zone and NAFO Fishing Boundaries